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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/917,633
Filing Date: July 31, 2001
Appellant(s): YAMAZAKI ET AL.

John F. Guay
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/21/2006 appealing from the Office action mailed 04/19/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on 11/21/2006 has been entered.

(5) Summary of Claimed Subject Matter

The Brief contains a summary of claimed subject matter. The Examiner believes the summary is in error. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the specification by page and line number, and to the drawing, if any, by reference characters. The brief is in error because the pages and line number referred to the specification by appellant do not expressly disclose the claimed subject matter, a metal advanced lateral crystallization region and a plurality of metal advanced crystallization regions. These two portions (regions) have no distinct boundaries that clearly define and distinguish these regions from each other. It is not clear where the metal advanced lateral crystallization region starts and ends. It is also unclear where the plurality of metal advanced

crystallization regions start and end. For the drawing (Fig. 1 and 2(b)), no reference characters are provided.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

JP2-140915	Oka	5-1990

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 3, 4, 6, 7 and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to claim 3, as illustrated in Fig. 1B, because claim language is not supported in the specification and claimed features are not clearly defined, the examiner considers impurity regions (source and drain regions 16A & 16B) as the plurality of

metal advanced crystallization regions located outside the channel region (the channel forming region under the gate electrode 14), and the channel forming region under the gate electrode 14 as shown in Fig. 1B as a metal advanced lateral crystallization region. As such, there is no support for the metal advanced lateral crystallization region including a channel region as claimed in claim 1 and including source and drain regions as claimed in claim 3. In deed, if a metal advanced lateral crystallization region includes a channel region as claimed in claim 1 and also source and drain regions (16A, 16B) as claimed in claim 3, then one skilled in the art would wonder where the plurality of metal advanced crystallization regions are formed. One skilled in the art cannot assume each source region (16A) has two portions or each drain region (16B) has two portions, wherein one portion of source (drain) region is a metal advanced crystallization region and another portion of source (drain) region is a metal lateral crystallization region because Fig. 1B shows source region 16A (or drain region 16B) having only one portion. It is suggested amending "the metal advanced lateral crystallization region" in claim 3 to read "the plurality of metal advanced crystallization regions".

With respect to claim 4, the impurity region 16A is considered as a source region, the impurity region 16B is considered as a drain region and a portion of the semiconductor film 12 defined and located between the source region 16A and the drain region 16B is considered as a conducting channel region. The regions 16A and 16B are indeed doped (page 7, second paragraph). As such, no dopant portions exist between the channel region and the source region 16A and the drain region 16B. No support is

found for the recitation of no dopant portions formed on sides of the channel region as claimed.

With respect to claims 6, 7 and 9 , the claims require the source region and drain region each has two portions respectively. As illustrated in Figure 1B, the source (impurity region 16A) has only one portion as does the drain (impurity region 16B). As such, there is no support for these claim limitations in the application as originally filed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Hideaki Oka (JP 02-140915).

Oka discloses a transistor (Figures 1a-d) comprising a substrate 101; source/drain regions 107 considered as having two portions wherein an outer portion of regions 107 right under the wires 110, 111 is characterized as a plurality of metal advanced (induced) crystallization regions and an inner portion of regions 107 overlapped under gate 106 together with a portion of a crystal grown silicon layer 105 under the gate 106 is characterized as a metal advanced (induced) lateral crystallization region with a semiconductor material (see Figures 1c, 1d), the portion of the layer 105 defined between regions 107 is also a conducting channel region, wherein at least one boundary or one portion (an inner portion of regions 107 overlapped under gate 106)

between the metal advanced lateral crystallization region and one the metal advanced crystallization regions (outer portion of region 107) is located outside the channel region (see attached drawings 1c-1d with red marks and red notations). The plurality of metal advanced crystallization regions is formed on sides of the metal advanced lateral crystallization region (channel region).

With respect to claim 2, the metal advanced lateral crystallization region 105 includes impurity doped regions 107 formed on sides of the channel region.

With respect to claim 3, the plurality of metal advanced crystallization regions include source and drain regions 107.

It is noted that no clear support or antecedent basis in the description is found for the terms "metal advanced (induced) crystallization region" and "metal advanced (induced) lateral crystallization region" used in the claims so that the meaning of the terms in the claims may be ascertainable by reference to the description. In fact, the meets and bound of these regions are undetermined and undefined.

It is noted that the following objections were made to the drawings and the specification in the final office action:

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the metal advanced (induced) lateral crystallization region as recited in claims 1-5, 9-13; a plurality of metal advanced (induced) crystallization regions in claims 1, 10, 12; and a channel region must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the metal advanced (induced) lateral crystallization region and a plurality of metal advanced (induced) crystallization regions formed on sides of the metal advanced lateral crystallization region as recited in claim 1, claim 10 and claim 12 must be shown or the feature(s) canceled from the claim(s). The boundaries and locations of these regions are not defined and shown to make a distinction between these different regions, the metal advanced (induced) lateral crystallization region from a plurality of metal advanced (induced) crystallization regions. No new matter should be entered.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the metal advanced lateral crystallization region including no dopant portions formed on sides of the channel region as recited in claim 4 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a source region having a first source portion adjacent to the channel region and a second source portion adjacent to the first source portion; and a drain region having a first drain portion adjacent to the channel region and a second drain portion adjacent to the first drain portion as recited in claim 5 and claim 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: a metal advanced (induced) lateral crystallization region in claims 1-5 and 9-13; a plurality of metal advanced (induced) crystallization regions in claims 1, 10 and 12; the metal advanced lateral crystallization region including no dopant portions formed on sides of the channel region as recited in claim 4; and a source region having a first source portion adjacent to the channel region and a second source portion adjacent to the first source portion, and a drain region having a first drain

portion adjacent to the channel region and a second drain portion adjacent to the first drain portion as recited in claim 5 and claim 13. The meets and bound of these regions as claimed are undetermined and undefined. There is no support or special definition of the claimed features or elements mentioned above in the description. The claim chart is not considered as a part of the disclosure and does not clearly identify the claimed features or elements. The process steps in the description and pointed out in the claim chart do not provide clear support for the exact locations and boundaries of the features or elements as claimed. For example, the exact locations of the metal advanced lateral crystallization region and the plurality of metal advanced crystallization regions so that skilled artisans would have recognized a metal advanced lateral crystallization region from the plurality of metal advanced crystallization regions. Also, the exact location and boundary of the channel region needs to be identified to avoid confusion. Furthermore, the exact location of the at least one portion (one boundary) between the metal advanced lateral crystallization region and one of the metal advanced crystallization regions located outside the channel region is required to be identified and pointed out in the description and shown in the drawings to prevent confusion. The exact locations of other remaining elements as mentioned above are also required to be shown in the drawings and pointed out in the description for clarity.

(10) Response to Argument

A. The rejection of claims 3, 4, 6, 7 and 9 Under USC 112, First Paragraph.

Appellant contend that the original specification and drawings provide sufficient support for the pending claims as demonstrated in a claim chart. The examiner

respectfully disagrees with the remark because the claimed features(a metal advanced lateral crystallization region including source and drain regions, and a plurality of metal advanced crystallization regions) are not shown and defined in the specification or drawings. A person having ordinary skill in the art would have difficulty understanding the claimed features from reading the specification and studying the drawings. By copying claims from the US patent 6,097,037 to provoke an interference, appellant claims features using language that is not supported by the specification as originally filed and creates confusion. Claims appear to claim at least two regions, a metal advanced lateral crystallization region including source and drain regions and a plurality of metal advanced crystallization regions while the specification and the drawings teach or show only one single crystallization region for the entire layer (12), wherein the crystallization layer (12) comprises a channel forming region under the gate electrode (14) and the impurity regions (16a, 16b) as source and drain on both sides of the channel region in the crystallization layer (12). Thus, it is unclear where the metal advanced lateral crystallization region including source and drain regions start and end. The boundary of the metal advanced lateral crystallization region is undefined. Also, it is unclear where the plurality of metal advanced crystallization regions start and end. Again, the boundaries of the plurality of metal advanced crystallization regions are undefined. It is noted that, the claimed subject matter is entirely new in this divisional application and is not present in the parent application from which appellant claimed priority. It is not clear from the disclosure what appellant intended to cover by the recitation of "a metal advanced lateral crystallization region including source and drain

regions" and "a plurality of metal advanced crystallization regions". MPEP 216 also requires a patent application must be filed that contains a full and clear disclosure of the invention in the manner prescribed by 35 USC 112, first paragraph. MPEP 2163 states an applicant's specification must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, i.e., whatever is now claimed. It is noted that the claim chart is not part of the disclosure and the specification stands objected to because there is no clear support for the claim language (lack of antecedent basis). Furthermore, the claim chart just lists the process steps in the specification that fail to provide clear support for the exact locations and boundaries of the claimed features (where the claimed elements start and end). The examiner has trouble understanding the relationship between the process steps with the claim language used for the claimed features in the claim chart. The specific process steps listed in the claim chart do not provide support for the claim language. Appellant is urged to use his own language supported in the specification to claim his invention instead of using someone else's language (copying the claims of US patent 6,097,037 to Joo et al.) to create misunderstanding and confusion.

With respect to claim 3, appellant argues that the examiner's statement is not appropriate when the examiner states that there is no support for the metal advanced lateral crystallization region including a channel region, and source and drain regions (first and second paragraphs of page 7 of the appeal brief). Appellant then cites certain pages, line numbers in the specification and figures wherein the metal advanced lateral crystallization region is alleged to include both source and drain regions and the

channel regions. The examiner respectfully disagrees with the remark because the process steps in the specification pointed out by appellant do not describe and provide clear support for the exact locations and boundaries of the claimed features such as the exact location of the metal advanced lateral crystallization region that shows where it starts and ends as well the locations of the plurality of metal advanced crystallization regions that show where these regions start and end. Figures 1A to 2D mentioned by appellant do not provide reference characters that clearly show and distinguish the metal advanced lateral crystallization region including both source and drain regions and the channel region from the plurality of metal advanced crystallization regions. Since the regions of the claimed features are not specifically defined in the specification with clear demarcation lines, these regions could be anywhere in the semiconductor layer (12) as shown in Fig. 1A and could be interpreted as anything people want them to be. It is the examiner's position that Figure 1A in the application shows a semiconductor layer (12) having only two portions, a first portion including source/drain regions (16A, 16B) and the second portion including a channel region between the source/drain (16A, 16B). Since claim 1 claims a metal advanced lateral crystallization region including a channel region, the examiner considers the second portion between source/drain (16A, 16B) that includes a channel as the metal advanced lateral crystallization region. The source/drain (16A, 16B) then is considered as a plurality of metal advanced crystallization regions as claimed in claim 1. It is confusing that source/drain (16A, 16B) on both sides of the metal advance lateral crystallization region is also considered as the metal advanced lateral crystallization region as claimed in claim 3. As such, the

source/drain (16A, 16B) are claimed to have two portions, wherein there is no demarcation line in the source/drain (16A, 16B) that show two portions. It is clear claimed features are not supported by the specification and the drawings.

With respect to claim 4, appellant argues that the examiner's statement is not appropriate when the examiner states that there is no support for "no dopant portions" between the channel region and the source/drain regions (third paragraph of page 7 of the appeal brief). Appellant states "no dopant portions" are shown as a region having a width depicted between opposing arrows (Fig. 1B). The examiner respectfully disagrees with the remark because the offset region (between opposing arrows) that appellant refers to as "no dopant regions" are part of the channel region. These offset regions are not specifically defined as separate "no dopant regions" and formed on sides of the channel region. Furthermore, Appellant is unable to point out exactly where in the specification is a disclosure that the offset region is not doped. It is noted that the channel region that includes the offset region as known in the art could be doped of a conductivity type opposite to the conductivity type of the source/drain region (16A, 16B).

With respect to claims 6, 7 and 9, appellant argues that the examiner's statement is not appropriate when the examiner states that there is no support for the first and second source portions and the first and second drain portions (page 8 of the appeal brief). Appellant further states that as long as any "grain boundary" exists in the source and drain regions, the grain boundary defines the first and second source portions and the first and second drain portions. The examiner respectfully disagrees with the remark. The "grain boundary" is not specifically defined in the specification as the

boundary that defines the first and second source portions and the first and second drain portions. Furthermore, the "grain boundary" alleged by appellant as existing in each of the source and drain regions are not shown or disclosed. Appellant did not show or state where the grain boundary is in each source and drain region.

In response to appellant's argument that certain page, and line numbers in the specification and figures discloses the claimed subject matter, the examiner clearly states in the Office action that the process steps in the specification pointed out by appellant do not describe and provide clear support for the exact locations and boundaries of the claimed features such as the exact locations of the metal advanced lateral crystallization region and the plurality of metal advanced crystallization regions, where these regions start and end, so that skill artisans would have recognized a metal advanced lateral crystallization region from the plurality of metal advanced crystallization regions. All the specific process steps in the specification that appellant referred to only point to a single crystallization layer, there are no demarcation lines separating the regions as claimed from each other. For example, the process steps referred to in the claim chart (page 2, lines 8-11, lines 15-17; page 3, lines 23-25; page 14, line 30; page 15, line 1; page 16, line 3, page 18, lines 7-8; and page 24, lines 2-3) could also mean a plurality of metal advanced crystallization regions instead of a metal advanced lateral crystallization region. When appellant decides not to use the same language in the specification to claim his invention and instead uses the claim language of someone else, this clearly creates confusion and misunderstanding. The same arguments go for other features claimed in claims 4 ,6, 7 and 9. The examiner by

reading the process steps disclosed in the specification did not find any support for the claimed features and claim language used by applicant as pointed out in the 112 rejections, specification objection and drawings objection. Also, the drawings do not show reference characters that distinguish the claimed features from each other.

Appellant also contend that while the specification and drawings of the parent application do not literally disclose the recited terms "metal advanced lateral crystallization region" and "metal advanced crystallization region", these terms would have been recognized by a person skilled in the art as being inherently disclosed in appellant's disclosure (page 11, lines 9-12 of the appeal brief). The examiner respectfully disagrees with the remark. These terms could not be recognized as inherently disclosed as alleged by appellant because the term "metal advanced crystallization region" is broad and may or may not include the more narrow term "metal advanced lateral crystallization region". Thus, "metal advanced lateral crystallization region" could be a part of "metal advanced crystallization region" or these regions could be two separate distinct regions. Claimed features are not clearly defined in the specification and claim language to make a distinction between these regions. As such, these terms would have not been recognized by a person skilled in the art as being inherently disclosed. Furthermore, the limitations "metal advanced" and "metal advanced lateral" are taken to be product by process limitations. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326 (CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227

USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not. As a result, in the final product, the metal advanced crystallization region and the metal advanced lateral crystallization region are both crystallization regions having the same characteristics that are not patentably distinguished from each other. So, it is not inherent to recognize these regions as distinct from each other as alleged by Appellant.

It is also noted that appellant admitted the specification and drawings of the parent application do not literally disclose the recited terms (see page 11, lines 9-12 of the appeal brief). Because of appellant's admission, it was urged that this application should be filed as a continuation-in- part application instead of divisional application and the priority date should be denied because the claimed features and claim language are new in this application and is not present in earlier parent application that appellant claimed priority date.

B. The rejection of claims 1-3, 10 and 12 under 35 USC 102(b) as being anticipated by Oka (JP 02-140915).

Appellant argues that Oka does not teach all limitations set forth in the pending claims because the source/drain regions of Oka cannot reasonably be considered "metal advanced (induced) crystallization regions". The examiner respectfully disagrees with the remark. Firstly, appellant in page 11, lines 9-12 of the appeal brief seems to

suggest that even though the term "metal advanced (induced) crystallization region" is not literally disclosed, the term would have been recognized as being inherently disclosed. The reference Oka discloses the same method of crystallization of the semiconductor layer (102, 105) as disclosed by the present invention and patterning the crystallization layer (102, 105) into islands comprising source/drain regions(107) and a channel between (107) regions. Then, it is inherent (by the appellant's own admission) that one skilled in the art would recognize the source/drain regions (107) of Oka as "metal advanced crystallization regions". Secondly, the limitation "metal advanced" is taken to be product by process limitations. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326 (CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not. In the final product, the source/drain regions of Oka are crystallization regions which are not patentable distinguished from the claimed features, crystallization regions.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

tt

Thien Tran

THIEN TRAN
PRIMARY EXAMINER

Conferees:

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